

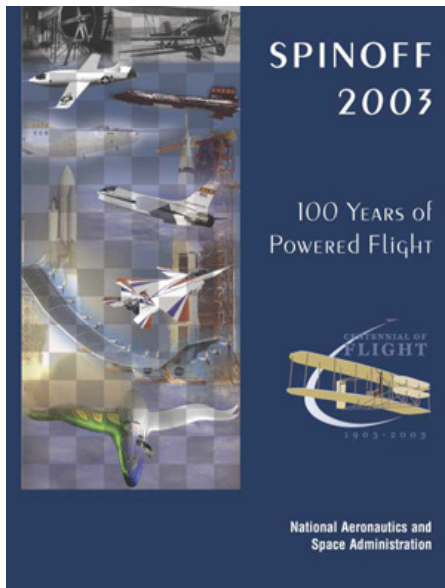


STI BULLETIN ONLINE

A quarterly publication of the NASA Scientific and Technical Information (STI) Program
produced by the NASA Center for AeroSpace Information (CASI)
for the users of our information products and services
October 2003

FEATURED ARTICLES

A New Spin on Flight



A New Spin on Flight NASA and Non-NASA NASA's *Spinoff* 2003 celebrates the centennial of flight and features NASA's new Education Enterprise.

Finding ways to apply cutting-edge technologies to life on Earth is one of the most important by-products of aerospace exploration and research. *Spinoff* 2003, NASA's premier publication, features the Agency's latest innovations, such as a hand-held personal safety device that warns pilots of potentially dangerous cabin pressure altitude conditions, and the cochlear implant, which has restored hearing for thousands of individuals, and allowed thousands of others born deaf to perceive sound for the very first time.

In addition to showcasing 53 commercialized products, *Spinoff* 2003 celebrates the 100th anniversary of the Wright brothers' historic first flight with a special section highlighting the vast aeronautical contributions made by NASA and its predecessor, the National Advisory Committee for Aeronautics. *Spinoff* 2003 also welcomes NASA's newest enterprise dedicated to education with an entire section devoted to the Agency's educational efforts in 2002-2003. Furthermore, the publication features a reference resource to NASA's technology transfer network for those interested in accessing, utilizing, and commercializing NASA technology.

Since NASA's inception in 1958, technologies resulting from the Space Program have introduced hundreds of new or improved products and processes to the American consumer because of partnership successes between NASA and private industry. NASA was first in developing the technologies for many of today's conveniences. *Spinoff* describes the latest products incorporating space innovation in the areas of health and medicine, transportation, recreation, consumer products, public safety, computer and manufacturing technology, and environmental and resources management.

Online versions of *Spinoff*, beginning with the 1996 issue, are available at <http://www.sti.nasa.gov/tto/spinoff.html>.

The *Spinoff* Web site also contains a searchable database of every technology featured over the past 28 years. Contact information for companies and consumers is available at spinoff@sti.nasa.gov.

A free print copy of *Spinoff* 2003 may be obtained by going to: www.sti.nasa.gov/tto/spin_order_form.html. Complimentary *Spinoff* 2003 interactive CDs, available in mid-November, may also be ordered at this site, or by calling the National Technology Transfer Center at 1-800-678-6882.

Additional information about the NASA Commercial Technology Network is available at: <http://www.nctn.hq.nasa.gov>.

NASA Technical Reports Server (NTRS) Pop Quiz

In keeping with our focus on education in this issue, we thought you might enjoy taking a little quiz on the NTRS- and maybe learn a little in the process. If you can answer all three questions, share your knowledge with others and send them to the [NASA Technical Reports Server](http://www.sti.nasa.gov/tto/spin_order_form.html).

What does the NTRS cover?

The NTRS was launched in April 2003 for an integrated search of the NASA and National Advisory Committee for Aeronautics (NACA) collections. The NTRS content focuses primarily on the NASA and NACA scientific and

technical report and journal literature. The current number of searchable citations in NTRS is 264K and growing. Users can expand their search to include information from organizations and agencies external to NASA by selecting non-NASA archives on the Advanced Search page. These non-NASA archives are comprised of both citation and links to full-text images. The NTRS harvests information from other NASA sources as well as non-NASA sources.

How are data "harvested" by NTRS?

The NTRS retrieves, or harvests, metadata from sites using the Open Archives Initiative (OAI) Protocol for Metadata Harvesting (OAI-PMH). The OAI-PMH (<http://www.openarchives.org/>) is a low-barrier protocol for data exchange for data repositories. NTRS harvests metadata from NASA centers, research projects, and affiliated institutes. It also harvests from non-NASA sources such as the Physics E-print Server, BioMed Central, the Energy Citation Database, and Aeronautical Research Committee reports from the MAGiC Project. The NASA STI Program Office is exploring new

ways to expand the scope of aerospace-related information in an OAI environment.

What enhancements can you anticipate?

The future direction of NTRS is to enhance the search functionality to include more data fields to search, expand the number of fields that display to users, and provide users access to full-text document images for the NASA technical reports.

FOCUS ON...

Education



Students at Williams Technology Middle School in Huntsville, Alabama are featured in a new segment of NASA CONNECT, a video series aimed at improving math, science, and technology education. Here, students conduct demonstrations showing how Newton's laws of gravity relate to the development of the next-generation space transportation.

The early days of space exploration inspired an entire generation to embark on careers in science and mathematics. These days-with interest in math and science decreasing-NASA has institutionalized inspiration. This can be seen everywhere, from the mission statement (<http://nasa.gov>) to the new Education Enterprise (<http://education.nasa.gov>) to the recruitment of Educator Astronauts, fully qualified members of NASA's Astronaut Corps (<http://www1.edspace.nasa.gov/what/whatis.html>) to the strong educational components that are essential parts of a range of NASA programs, projects, and missions.

In 2002 alone, NASA reached well over half a million educators, nearly two million students in kindergarten through the 12th grade, and almost 70,000 higher education students through direct, on-site activities and programs. In addition to those served by broad-based NASA education programs, the Agency also directly reached over 17,000 minority students through its minority-targeted academies, scholarships, and other initiatives.

The NASA Scientific and Technical Information Program supports these efforts by providing publications and videos to those who are developing educational programs and materials. The following is a selection of 2003 publications and their Document IDs from the NASA Aeronautics and Space Database. All documents can be ordered from the NASA Center for AeroSpace Information (CASI) Help Desk (help@sti.nasa.gov). If you are a NASA or other Federal agency employee, prime contractor, or grantee, you can view and obtain them directly at <http://www.NASAeronauticsSpaceDatabase.nasa.gov>. Some references are also available through the [NASA Technical Reports Server \(NTRS\)](#).

Concepts

Robbins, Kay A. Changing the Paradigm: Preparing Students for the Computing Profession in the 21st Century. Document ID (CASI): 20030022717.

Topics, Tools, and Techniques

Doherty, Paul. Science Explorations with Simple Materials From the Exploratorium. Document ID (CASI): 20030062884.

Ericsson, Aprille Joy. NASA Overview (K-12, Educators, and General Public). Document ID (CASI): 20030053385.

Han, Gina. Science Buddies. Document ID (CASI): 20030062873.

Harris, Nikki; Wall, Curtiss E.; Jacobs, James A. MST-Online: The Updating of an Educational Internet Resource in Materials Science and Technology. Document ID (CASI): 20030062859.

Lisensky, George. ABCs of Nanotechnology: Atoms, Bits, and Civilization. Document ID (CASI): 20030062885.

Okuda, Roy K. Science Fairs as a Vehicle to Inspire the Next Generation of Scientists and Engineers. Document ID (CASI): 20030062881.

Prior, Edwin J.; Jacobs, James A.; Chung, W. Richard. National Educators' Workshop: Update 2002 - Standard Experiments in Engineering, Materials Science, and Technology. Document ID (CASI) 20030062842.

Rusin, John M. Attention-Getting Materials Science Demonstrations. Document ID (CASI) 20030062849.

Rusin, John M.; Stoebe, Thomas G. Status of Materials Science and Technology (MST) Curriculum. Document ID (CASI): 20030062882.

Simoës, Ricardo. Computer Graphics Software For Teaching Crystallography. Document ID (CASI): 20030062880.

White, Nicholas E.; Lochner, James; Rohrbach, Gail; Cochrane, Kim. What is your Cosmic Connection to the Elements? Document ID (CASI): 20030057145.

Projects, Programs, and Partnerships

Bagg, Thomas C., III; Brumfield, Mark D.; Jamison, Donald E.; Granata, Raymond L.; Casey, Carolyn A. Systems Engineering Education Development (SEED) Case Study. Document ID (CASI): 20030025438.

Bannerot, Richard B.; Sickorez, Donn G. National Aeronautics and Space Administration (NASA)/American Society of Engineering Education (ASEE) Summer Faculty Fellowship Program - 2000. Document ID (CASI): 20030064055.

Carlson, Barbara. The Institute on Climate and Planets (ICP): A Research Education Program; Final Report. Document ID (CASI): 20030022716.

Chaudhury, S. Raj; Rodriguez, Waldo J. Scientific Visualization & Modeling for Earth Systems Science Education; Final Report. Document ID (CASI): 20030012606.

Gans, Gary. University Program Management Information System: NASA's University Program Active Projects. Document ID (CASI): 20030019874.

Hayes, Charles R. Educational Outreach Program Summary. Document ID (CASI): 20030062857.

Kankam, M. David. Glenn's Strategic Partnerships With HBCUs and OMUs. Document ID (CASI): 20030060675.

Kundu, Nikhil K.; Leach, Sarah E. Swing Set Design: A Project In Stress Analysis. Document ID (CASI): 20030062843.

Lumpp, Janet K. KEEP: Kentucky Electronics Education Project, Microelectronics as a Theme in Math and Science. Document ID (CASI): 20030062875.

Monroe, Joseph; Kelkar, Ajit. Integration of NASA Research into Undergraduate Education in Math, Science, Engineering and Technology at North Carolina A&T State University; Final Report. Document ID (CASI): 20030020929.

Pascali, Raresh. Development and Engineering Design in Support of "Rover Ranch": A K-12 Outreach Software Project; Final Report. Document ID (CASI): 20030064069.

Rosendhal, Jeffrey; Gould, Roy R. NASA Education Forum at SAO on the Structure and Evolution of the Universe; Annual Report. Document ID (CASI): 20030052731.

DEPARTMENTS

From the Users

This department is for you! We welcome your contributions and comments. [Send them to us](#), and we will publish them in the next issue.

NASA Videos

Q. Where I can order some NASA footage of the Earth as seen in space. I would like to have a VHS and eventually a beta SP or digibeta tape.

A. CASI distributes NASA video footage. All videos are formatted in VHS and Betacam SP and are distributed in the U.S. broadcast standard, NTSC. To receive videos in other formats or foreign broadcast standards (PAL or SECAM), please contact the [STI Help Desk](#) for increased pricing.

Option 1. You can search the Video Catalog yourself at <http://www.sti.nasa.gov/Pubs/Videocat/videocat.pdf>. The Catalog is produced in a searchable PDF document. Click on the binocular icon to search for keywords. The abstracts of approximately 2,000 videos are listed in the catalog. After you find a video of interest to you, note the document ID number and the title, then use the Secure Online Order Form bookmark link to make your purchase.

Option 2. You may wish to have us conduct the search for you. We charge \$30 (for domestic users) or \$60 (for international users) for one Quick Search, which identifies the best videos (by their abstracts) per your recommended subject.

Option 3. Since you are searching for Earth views, we recommend contacting [NASA Goddard Space Flight Center](#), which focuses on Earth science. They specifically have a mix of shuttle and satellite imagery of the Earth.

From The STI Program Office

New STI Website for Inside NASA Portal Coming Soon

The STI Program is completing the effort to design a new Website to link to the Inside NASA portal. Extensive comments from users have been received and incorporated into the new design. Final technical and design implementation is currently being completed with the expected release date in late November.

Publication News

Current Topics

Each year NASA produces new educational products, which are used by NASA education staff at NASA-sponsored workshops and events. The following are 2003 publications. Electronic versions of these products are available on [NASA Spacelink](#) and may be printed and copied as needed.

Educational Briefs

Title	Audience	Grade Level
Wireless Drop Tower for Microgravity Demonstrations EB-2003-01-19-MSFC	Educators & Students	9-12

Educator's Guides

Title	Audience	Grade Level
Exploring the Extreme Guide A Teacher's Guide with Activities in Mathematics, Science and Technology EG-2003-01-001-DFRC	Educators	K-8
Learning to Fly: The Wright Brothers' Adventure An Educator Guide with Activities in Aeronautics EG-2003-02-007-GRC	Educators & Students	6-9
Rockets A Teacher's Guide with Activities in Science, Mathematics, and Technology EG-2003-01-108-HQ	Educators	K-12
Science in a Box An Educator Guide with NASA Glovebox Activities in Science, Mathematics, and Technology EG-2003-01-009-GRC	Educators & Students	9-12

Educational Programs

Title	Audience	Grade Level
NASA Aerospace Education Services Program (AESP) State Contacts EP-2003-03-396-HQ	Educators & Students	All
NASA Digital Educational Resources Brochure EP-2003-07-412-HQ	Educators & Students	K-Post Doctoral
NASA Explorer Schools Brochure EP-2003-06-411-HQ	Educators	4-9

Educational Wall Sheets

Title	Audience	Grade Level
Educator Astronaut Program Poster EW-2003-02-139-HQ	Educators	K-12
International Space Station CAD Wall Sheet EW-2003-06-141-HQ	All	7-12
NASA Student Involvement Program Poster EW-2003-02-135-HQ	All	K-12
Night Lights Poster EW-2003-03-007-GSFC	All	5-8
Program de Participacion Estudiantil de la NASA NSIP Poster-Spanish Version EW-2003-03-140-HQ	All	K-12

Educational Videotapes

Title	Audience	Grade Level
Data Analysis and Measurement: Dancing in the Night Sky NASA CONNECT Videotape Series An educator guide for Mathematics, Science, and Technology EG-2003-02-05-LARC	Educators	6-8

History

New Publications

Thinking About NASA History Folder. This folder contains materials aimed at familiarizing scientists and engineers with the manner and process in which NASA History materials are created. The materials also provide a good example of historical models and thought processes for historians not familiar with NASA. To request a free copy, call (202) 358-0384 or email hinfo@nasa.gov.

Stages to Saturn: A Technological History of the Apollo/Saturn Launch Vehicles by Roger E. Bilstein. This book, published by the University Press of Florida, is a reprint of the original NASA SP-4206. The entire text as well as illustrations and pictures are included in this publication. The publication may be ordered directly from the [University Press of Florida's website](http://www.upf.edu).

American X-Vehicles: An Inventory- X-1 to X-50 by Dennis Jenkins, Tony Landis, and Jay Miller is Monograph in Aerospace History 31 (NASA SP-2003-4531). This concise, but very informative monograph covers the various experimental aircraft in sequential order and also includes details about the lifting bodies and D-558. It also provides flight statistics for each X-Vehicle and background on each vehicle program. The publication may be obtained by sending a self-addressed 9x12" envelope for each monograph with appropriate postage for 17 ounces (typically \$3.95 within the U.S., \$5.70 for Canada, and \$12.15 for overseas - international customers are asked to purchase U.S. postage through an outlet such as www.stampsonline.com) to the NASA Headquarters Information Center, Code CI-4, Washington, DC 20546.

Concept to Reality: Contributions of the NASA Langley Research Center to U.S. Civil Aircraft of the 1990s (SP-2003-4529) by Joseph R. Chambers. This substantial publication is a companion to the author's Partners in Freedom (monograph 19) which covers Langley's contributions to military aircraft. Concept to Reality is Monograph in Aerospace History #29. To request a copy of this monograph, please send a self-addressed 9x12" envelope for each monograph with appropriate postage for 17 ounces (typically \$3.95 within the U.S., \$5.70 for Canada, and \$12.15 for overseas. International customers are asked to purchase U.S. postage through an outlet such as www.stampsonline.com) to the NASA Headquarters Information Center, Code CI-4, Washington, DC 20546.

Voyager's Grand Tour: To the Outer Planets and Beyond by Henry C. Dethloff and Ronald A. Schorn has been published by the Smithsonian Institution Press. Every 176 years, Earth and the outer planets gather on one side of the sun, allowing close observation in a single flight, or Grand Tour. To exploit this alignment, the Voyager team developed the so-called gravity assist that essentially sling-shot Voyager I and II from planet to planet. Since their 1977 launch, the probes have discovered strange new worlds and transmitted streams of revolutionary data and eye-popping images that have exploded long-held theories and raised new questions about our solar system. In this book, readers are invited into Voyager's inner circle, conceiving, launching, and directing the craft as it discovers rings around Jupiter, geysers on Triton, and intriguing possibilities of extraterrestrial life. It is available for purchase from [the Smithsonian Press web site](http://www.smithsonianpress.com).

On the Frontier: Experimental Flight at NASA Dryden by Richard P. Hallion and Michael H. Gorn has also been published by Smithsonian Press. Aviation enthusiasts will savor the most detailed account available of record-setting aircraft like the X-1 and X-15, flown by Chuck Yeager and other legends, as well as all the cutting-edge NASA and Defense Department programs that perfected the aeronautical concepts and technology used in U.S. military, space, and commercial craft. This is a significantly revised and updated version of a classic work and includes three new chapters, dozens of rare photographs, and a completely updated text. It is available from [the Smithsonian Press Web site](#).

New Electronic NASA History Resources

[NASA's 45th Anniversary](#). NASA began operations on October 1, 1958. Learn more about its origins in the NACA and the reasons for its transformation.

[Apollo 16 Flight Journal](#) by David Woods and Tim Brandt. This journal provides a comprehensive look at the Apollo 16 flight from launch to splashdown.

[The Thinking About NASA History Folder](#). This folder contains materials aimed at familiarizing scientists and engineers with the manner and process in which NASA History materials are created. The materials also provide a good example of historical models and thought processes for historians not familiar with NASA.

[Forecast of Upcoming Anniversaries](#). This site chronicles major anniversaries in aeronautics and astronautics for the upcoming months.

[Flight Research at Ames, 1940-1997](#) (NASA SP-3300, 1998) by Paul F. Borchers, James A. Franklin, and Jay W. Fletcher. A richly illustrated, monograph-length publication, this is a very informative work on aeronautics research in general. A special thanks to Chris Gamble for formatting this book for the Web.

[The Planetary Quarantine Program: Origins and Achievements, 1956-1973](#) (NASA SP-4902, 1974) by Charles R. Phillips. A thin, but significant, volume on a topic of considerable interest over the years. Thanks to Chris Gamble for scanning and formatting this book for the Web.

[Engineer in Charge: A History of the Langley Aeronautical Laboratory, 1917-1958](#) (NASA SP-4305, 1987) by James R. Hansen. A well-written, informative Center history of NASA Langley's aeronautical research roots. Special thanks to Chris Gamble for preparing this book for the Web.

[Spaceflight Revolution: NASA Langley Research Center From Sputnik to Apollo](#) (SP-4308, 1995) by James R. Hansen. This volume picks up where Engineer in Charge left off by addressing NASA's forays into spaceflight research. Special thanks to Chris Gamble for preparing this book for the Web.

[Exploring the Unknown: Selected Documents in the history of the U.S. Civil Space Program, Volume III: Using Space](#) (NASA SP-4407). This is the third volume in an ongoing series of reference books that are useful for those interested in both space history and space policy. It

consists of four chapters of documents with introductory essays. You may also want to see some of the other volumes in this series that are online in a similar format by clicking [here](#). Thanks to Chris Gamble for scanning this resource for the Web.

Click here for information on the [STS-107\(Columbia\)](#) accident. Much historical information is also available about the [Apollo 1](#) and [STS-51L \(Challenger\)](#) accidents, as well as general [Shuttle history](#).

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